DISTANCE LEARNING FOR THE DEVELOPMENT OF HUMAN RESOURCES AND KNOWLEDGE

Prof. D. M. Jusubalieva, DSc1

Abstract: One of the requirements of the international community regarding the training of specialists is quality education. The Republic of Kazakhstan is actively implementing new information technologies in the educational process to promote quality of learning materials. One of the most promising educational technologies is the technology of distance learning. Distance learning gives students the opportunity to study at a distance from the training centre, thereby expanding the boundaries of education, even going beyond a single state. The article shows the main trends in and methods of implementing distance learning in higher educational institutions in the Republic of Kazakhstan, their advantages and problems, and the conditions that are necessary to implement distance learning technologies.

Keywords: distance learning, module, distance learning technology, tutor, Internet, digital content, digital educational resources

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odern society is in a state of global change. Today many countries around the world have established efficient electronic governments and electronic universities (e-universities) for active electronic learning (e-learning). These are only some of the concepts and phenomena that simply did not exist some 30 years ago and that today are part of our everyday lives, affecting both the economic and the political mechanisms of the society. Nowadays the system of education is undergoing significant changes. Modern information technologies are being implemented in the educational process throughout the whole system of education (in schools, colleges and universities.) The highest level of these educational information technologies comprises of distance learning technologies. Our experience has shown that

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the demand for distance-learning educational products is high and that the provision of such products has become a very profitable business. For example, according to some researchers, the export of educational services from the USA generates on average US\$ 13 bln. annually and ranks fifth among the export sectors of the US economy [1]. Many countries report that 70-80% of their GDP is derived from the knowledge-based economy. Moreover, since 2010 the global body of knowledge has been doubling every 72 hours (3 days). [2] With the development of computer and Internet technologies, e-learning has been implemented actively in the educational process of vocational higher education. Modern technologies provide the means for remote interaction between teachers and students that matches conventional educational methods. The article shows the main trends in and methods of implementing distance learning in higher educational institutions in the Republic of Kazakhstan, their advantages and problems, and the conditions that are necessary to implement distance learning technologies (DLT).

I.

The term "e-learning" became popular relatively recently in Kazakhstan. It denotes a number of innovations in the use of modern information and communication technologies (ICT) in education (computer-aided learning, interactive multimedia, web-based learning, online education, etc.), which have gradually bridged the gap between distance learning and traditional methods of university education [1,4]. The term "e-learning" denotes the integration of distance and traditional methods of education based on ICT. Today a completely new philosophy of e-learning has been established on a global scale based on UNESCO's "life-long learning" principle.

The transition to a credit-transfer system of education allows colleges and universities to reduce the number of regular classes and increase the percentage of a student's independent workload up to 70%. This requires proper organization and timely control over the execution of independent assignments using distance-learning technologies (DLT). The main tasks in implementing DLT include: providing students with the most convenient learning environment from all locations with access to the Internet (which increases students' motivation), achieving the necessary transparency in the process of "teacher-student" interaction; implementing mechanisms for the self-development of the system [3].

Distance-learning technologies make education more affordable and increase the rate of growth in the knowledge-based economy [3].

The level of utilization of such technologies is one of the indicators for the degree of digitalization of a higher school's educational process and in certain cases may indicate the quality of its graduates. This is why the global education system has to employ effectively all forms and pedagogical technologies used around the world for the development of human resources and the provision of high-quality education and knowledge.

As DLT have become part of the learning process, their implementation must comply with certain regulatory requirements.

In the legislation of the Republic of Kazakhstan (the Law on Education from July 27, 2007, No. 319-III) distance learning is defined as an educational technology. With the "Ordinance on the organization of educational process based on distance-learning technologies" enforced by the Government on January 19, 2012, No. 112, universities were allowed to provide distance-learning courses independently and today such courses are provided by many Kazakh universities.

However, to be effective, DLT should be implemented using *a systematic approach*. The first step in this systematic approach is to consider all components of the distance-learning system: *methodological*, *pedagogical*, *scientific*, *economic*, *and organizational* [4].

In a distance-learning system, these components differ from their counterparts in the system of traditional education, which is why we have to determine *the place and role of distance education in modern education*.

The most important task - essential for organizing a high-quality distance-learning process - is to define the *methodological foundations of distance learning*. First, we have to determine:

- 1. What is meant by "distance learning" is it *a form or a technology*.
- 2. What pedagogical methods are used in the educational process.

We should also answer some questions regarding:

- the operative provision of education information to learners;
- teacher feedback;
- the remote assignment of group and individual tasks.

Today, distance learning is provided in all Kazakh universities not as a form of education, but as distance-learning technologies. For people with disabilities, distance learning is a *form* of education (inclusive education) in which the educational process is based on the best traditional and innovative methods, tools and forms of teaching using computer and telecommunication technologies.

Distance learning must be considered in relation to the complexity of the many other issues (*philosophical*, *psychological*, *medical*, *etc.*) it affects.

For example, the concept of the *electronic textbook* is related to a number of issues such as the comprehensiveness of electronic information,

determining the admissible volumes of information, determining the format of on-screen objects, animation, etc.

The economy of distance education is determined by the changes in the role and functions of educational agents (teachers, students.) Teachers assume new functions they do not have in the traditional system. For example, they must have computer skills, must be able to develop and use interactive teaching applications, and must be experts in the field of information technology.

The system of distance education also requires different organization, management and legal forms of the educational process because distance education uses distributed educational resources and flexible curricula and it does not require classrooms and lecture theatres.

However, despite the diversity of the technical means and technologies used in distance education, the quality of education depends primarily on the positive characteristics of the study aids, their forms and the organization of the learning process. In other words - on the way we use the didactic materials.

The core of education is the interaction between the teacher and the student. The best teaching methodology is conventional face-to-face interaction (direct communication). Using this methodology, the quality of education depends on many factors and, above all, on the *professional and personal qualities of the teacher*. Their importance has been growing ever since the earliest stages of the development of the modern means of indirect interpersonal communication using delayed feedback. *Indirect communication* is the core technology of distance learning.

Its communicative intensity depends on the level of technological advancement. This is why, in this regard, the advent of computers and especially of computers with multimedia capabilities was a fundamental change in the role of the technical means of education.

The main difference between the computer and the other technical aids is that it can interact with users through *interactive applications*. Through this communication channel, computers serve both as a medium of teacher-student communication and as a means of organizing the learning process. Thus, *it* seems to become yet another agent of the learning process.

Therefore, **independent learning has become** a dominant form in the cognitive process. The shift of emphasis from class-based to independent learning means that we should *reconsider the teaching methods and the organization of the learning process*.

The traditional learning process in higher schools is based on direct communication - teaching is carried out mostly by giving *lectures and*

conducting seminars and tutorials. These so-called "informative lectures" account for the best part of the curricula [3].

Using computers, we can turn traditional teaching methodology into **multimedia-based methodology** - **lectures** (*interactive and non-interactive*) can be sent as digital storage media or published on the university's website. As we know, during a conventional lecture, experienced teachers can intuitively sense the mood of the audience and its willingness to accept information and, accordingly, can make ad hoc changes to their lectures. In distance learning, where students study on their own, the assessment of accumulated knowledge and its absorption is controlled by *mediated feedback*. This is why the way information is presented and structured in electronic publications using not only text but also various other media forms (images, animation, sound, etc.) is very important for the interactive learning outcome.

A multimedia self-study aid may include multimedia (visual and audio) lecture aids intended to facilitate the comprehension of the lecture given by the teacher [4].

Study aids are the most important factor in the organization of a highquality learning process. This is why we now face a serious problem related to the development of a fundamentally new type of informative learning materials with an extremely wide range of teaching possibilities.

II.

Nowadays, with the integration of e-learning in the educational process, the role of electronic and multimedia teaching and learning aids for the individual preparation of students is extremely important because these aids are intended to improve the quality of education.

Regarding distance learning (DL), we must first define its characteristics and determine to what cases it may not be applicable.

The main characteristics of DL include:

1. The use of modern information technologies, such as

- e-mail
- teleconferencing
- The submission of data using FTP servers
- hypertext media WWW servers
- World Wide Web resources, databases
- information-seeking systems
- videoconferencing
- 2. The individualization, flexibility and adaptability of education

Modern communication technologies ensure that distance learning is sufficiently interactive. This is achieved by using various software applications, such as the MOODLE platform, as well as by e-mail. Thus, the students can contact their teachers at any time and from anywhere, and teachers can respond to their enquiries as well as supervise and assess their progress interactively.

3. The availability of an advanced learning environment

Modern information technologies provide a flexible and diverse learning environment. In addition to conventional teaching aids, students can now use:

- learning software
- multimedia resources (electronic and multimedia textbooks, digital educational resources)
- computer-based assessment systems
- electronic reference books and encyclopaedias
- audio and video resources
- information resources published on the Internet, etc.

4. The efficiency of distance learning as an educational technology

Statistically, at least 80% of students can use all types of educational resources. This means that most people can study effectively in a distance-learning environment.

5. Economic efficiency

For universities that aim to attract a large number of students (including foreign students), distance learning is the only possibility in terms of **economic efficiency**. According to the International Centre for Distance Learning (ICDL, 2000) distance learning courses are provided by more than 50 universities and colleges in the UK and by more than 1,000 educational institutions worldwide. In these schools, which are already overwhelmed by the constantly growing number of students and courses while their funding increases at a slower rate, distance learning is probably an efficient alternative to the conventional lecture-and-seminar-based system. Using distance learning courses they can teach a large number of students (sometimes more than 10,000) simultaneously, while teaching the same number of students using the traditional process will be far more cost-inefficient and result in significant losses [5].

6. The availability of modern multimedia resources and technologies

These can be used for the development of high-quality learning applications with significantly greater didactic value compared to conventional textbooks. Students can use these multimedia courses to study on their own, but in order to interact with their teachers and collaborate with their fellow students they need suitable communication devices and information techno-

logies. These devices will allow them to benefit from the whole range of pedagogical technologies used in distance learning and will minimize the feedback lag.

Traditionally, universities use distance-learning technologies to provide courses in regional training centres. These centres are equipped with the relevant equipment and software needed for lectures, seminars and tutorials and develop their own interactive courses, self-study materials, etc.

Distance learning technologies are also used in the traditional educational process as a means for assigning independent tasks to students. They are very convenient because the students can access courses from each point with Internet connectivity (which increases their motivation), ensure the necessary transparency of teacher-student interaction, and provide mechanisms for the self-development of the system.

With regard to the use of distance-learning technologies, particular attention should be paid to the development of the course concept, which should take into account the different types of activities assigned to the students with respect to their acquisition of the knowledge and skills required.

Shifting most of the study load to independent tasks and assignments raises the importance of methodological instruction (study guides), discussion forums, etc. It also results in stricter requirements regarding assignment assessment and transparency and the comprehensibility of assessment criteria. In such systems, control is especially important - the teacher (tutor) controls the allocation of tasks and individual assignments in each module, their submission by the students within the set timeframe (the system can be set to notify both the students and teachers by SMS), publishes consultation timetables in a chatroom/forum and supervises attendance. Furthermore, the use of distance-learning technologies intensifies the use of interactive video- and teleconferencing applications (e.g. Skype). Another important factor is the design of the multimedia electronic course book that will be used during the distance learning course.

Virtual learning environments with interactive parameter control are increasingly replacing traditional specialist courses. Such environments can emulate virtual production processes and also assess and rate the performance of students and analyse their errors. All controls and tools on the virtual production site have the characteristics of those used in real life.

Distance-learning technologies can be especially useful for developing "dual diploma" (sandwich) courses and establishing contact with students seeking academic mobility abroad. They can also be efficient as a means of organizing continuing education (lifelong learning) courses because they provide the participants with flexible organization of their work and studies.

Another aspect of DLT is the increasing possibilities for interaction between universities and businesses and the integration of scientific research and business projects.

The accumulated experience and the opportunities for utilization of distance-learning technologies in higher schools will enable their managers and staff to implement an **innovation-oriented university**, which is an important component of the knowledge-based economy.

The implementation of information technologies in education is not limited to the development of distance learning courses and the use of DLT. This process is much wider: today many universities have implemented electronic management systems by creating electronic universities.

A good example in this respect is the Abilay Khan Kazakh University of International Relations and World Languages, which has gradually transformed into an electronic university using tailor-made software for record-keeping and control over all structural units of the university in strict compliance with current legislation.

According to the Standards for the Organization of the Learning Process and depending on the credit-based organization of the courses offered at the university, students have online access to all necessary information via a single access point – the <u>"Student's Personal Office"</u> from the university's website, where they can:

- ✓ choose their lecturers/tutors based on their qualification and timetable (a personalized syllabus can be designed for one year of the course of studies);
 - ✓ check their class timetables for the whole course of studies;
- ✓ interact with their teachers both online and offline throughout the whole period of their studies (to access the teacher's course curriculum and resources, and the university's and the National inter-university electronic library resources);
 - ✓ check their course grades (both interim and final).

Students who do not have access to the Internet can use free-access terminals in the university buildings.

The faculty also benefit from the implementation of modern information technologies, because they can use the <u>"Teacher's Personal Office"</u> from the university's website, where they can:

- ✓ publish electronic course curricula and resources for the students;
- ✓ monitor attendance:
- ✓ check their class timetable and download lists of course participants (room, building, and time period of classes);

✓ maintain an electronic logbook of interim and term tests. The grades are automatically transferred to the "Registrar" module and cannot be corrected, which is an anti-corruption measure.

The Automated Learning Management System (see Figure 1) provides a complex solution for automated record processing and the collaboration of employees responsible for the control and analysis of labour discipline, including:

- ✓ the centralized safekeeping of documents;
- ✓ operational access to documents;
- ✓ registration of incoming and outgoing documents;
- ✓ access to and editing of documents;
- ✓ control over document versions;
- ✓ content-related document seeking;
- ✓ processing of documents;
- ✓ group access to documents with options for approval, confirmation and control over document execution;
- ✓ control and analysis of labour discipline;
- ✓ reporting and control of individual workloads [6].

Reporting of workloads

Reporting and control of execution

Registration

Registration

Registration

Figure 1. Automated Learning Management System (ALMS)

Modern information technologies allowed the implementation and maintenance of a cost-efficient learning management system and an overall system for the management of educational business processes.

The efficiency of modern information technologies in education depends on the level of the IT competence of administrators, teachers and students. While implementing the ALMS in our university we had to deal with this problem by organizing training courses for all administrators and faculty members by also using distance-leaning technologies.

Existing educational information technologies, including DLT, have certain disadvantages as well. Some of these disadvantages are:

- 1. Problems related to student identification presently we cannot check the identity of students who sit examinations. Some of the schools that provide DLT courses are trying to solve this problem by using webcams, compulsory attendance sessions, commissioning faculty members to educational centres, or using other forms of control considered suitable.
- 2. The existing state regulations in the field of distance learning should be updated and improved.

These drawbacks may be gradually mitigated as modern information and communication technologies (ICT), innovative pedagogical technologies and efficient regulations are developed because they will provide new opportunities for the implementation of more efficient educational methodologies and general information technologies.

* * *

We may conclude by saying that today we need a new model of education and innovative learning management systems to meet the needs of the modern information society. These and many other problems should be solved jointly by scientists and educators interested in improving the efficiency of information technologies in education. Thus, distance-learning technology can be used effectively for the overall development of human resources and knowledge.

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